Please amend the claims as follows.

IN THE CLAIMS:

1. (Currently Amended) A decoder, having an input signal with a predetermined frequency and ~~a first output signal~~ providing a left channel signal and a right channel signal, comprising:

a first low pass filter for low pass filtering the input signal to provide a first filter output;

a first decimator coupled to the first low pass filter for decimating the first low pass filter output to reduce a sampling frequency of the input signal, the first decimator providing an output signal that contains a sum of left channel information and right channel information;

a multiplier for multiplying a predetermined value by the input signal to generate an intermediate signal, wherein the input signal has a pilot signal component and wherein the pilot signal component in the intermediate signal is a lower frequency than the pilot signal component in the input signal;

a second low pass filter for receiving the intermediate signal and providing the pilot signal component as an output;

~~a phase angle estimation means for receiving the pilot signal component from the output of said filter, said phase estimation means determining an approximate phase of the pilot signal component of the input signal and generating at least one trigonometric function using the approximate phase of the pilot signal component of the intermediate signal;~~

a second decimator having a predetermined decimation factor and coupled to the second low pass filter, the second decimator reducing a sampling rate of the pilot signal component to no more than substantially 12k samples per second;

a digital phase lock loop coupled to the second decimator for determining an approximate phase of the pilot signal component and generating at least one

trigonometric function using the approximate phase of only the pilot signal component, the at least one trigonometric function representing a phase angle needed to correct phase error associated with an output signal that contains a difference of left channel information and right channel information;

quadrature mixer means coupled to the input signal for shifting the input signal from the predetermined frequency to a lower frequency by forming a pair of quadrature signals;

a third low pass filter and a fourth low pass filter, each ~~for~~ respectively low pass filtering ~~each~~ a predetermined one of the pair of quadrature signals;

a ~~second~~ third decimator coupled to the third low pass filter for decimating a first of the pair of quadrature signals to provide a first quadrature mixer output;

a ~~third~~ fourth decimator coupled to the fourth low pass filter for decimating a second of the pair of quadrature signals to provide a second quadrature mixer output;

means for using the at least one trigonometric function, the first quadrature mixer output and the second quadrature mixer output to generate a phase aligned output signal that contains a difference of the left channel information and the right channel information; and

means for using the output signal that contains a sum of left channel information and right channel information and using the output signal that contains a difference of left channel information and right channel information to generate ~~a~~ the left channel signal and ~~a~~ the right channel signal, the means comprising a fifth low pass filter and a sixth low pass filter that are dynamically and separately controlled low pass filters, the fifth low pass filter processing the output signal that contains a sum of left channel information and right channel information and having its bandwidth varied after first varying bandwidth of the sixth low pass filter that processes the output signal containing a difference of left channel

information and right channel information, an amount of bandwidth adjustment ~~depending upon received signal conditions~~ being increased in proportion to detected increased signal distortion.

2. (Original) A decoder as in claim 1, wherein the at least one trigonometric function includes a sine function and a cosine function.

3. (Original) A decoder as in claim 1, wherein the predetermined value is retrieved from a table.

4. (Original) A decoder as in claim 3, wherein the predetermined value is a cosine value.

5. (Previously Presented) A decoder as in claim 1, wherein said first decimator, second decimator and third decimator each decimate by approximately a same decimation factor.

6. (Previously Presented) A decoder as in claim 5, further comprising a fourth decimator coupled between the second low pass filter and the phase angle estimation means, the fourth decimator decimating the pilot signal component.

Claim 7 (Canceled)

8. (Currently Amended) A decoder as in claim 1, wherein said means for using the output signal that contains a sum of left channel information and right channel information and using the output signal that contains a difference of left channel information and right channel information further comprises:

combining circuitry, coupled to said fifth low pass filter and said ~~second~~ sixth low pass filter, said combining circuitry combining the fifth low pass filter output and the sixth low pass filter output to produce the left channel signal and the right channel signal; and

control circuitry coupled to the fifth low pass filter and the sixth low pass filter for modifying bandwidth of the fifth low pass filter and the sixth low pass filter in response to presence of adjacent signal interference and distortion of the input signal.

9. (Currently Amended) A decoder as in claim 8, wherein the control circuitry modifies bandwidth by varying filter coefficients of said fifth ~~ew~~ low pass filter and said sixth low pass filter.

10. (Previously Presented) A decoder as in claim 8, wherein said fifth low pass filter and said sixth low pass filter are FIR filters.

11. (Original) A decoder as in claim 1, wherein the decoder is used in a radio receiver.

12. (Original) A decoder as in claim 1, wherein the predetermined value is approximate to, but not equal to, a frequency of the pilot signal component in the input signal.

13. (Original) A decoder as in claim 12, wherein the predetermined value is within 3 kilohertz of the frequency of the pilot signal component in the input signal.

Claim 14 (Canceled)

15. (Currently Amended) A decoder as in claim ~~14~~ 1, wherein said first decimator reduces sampling rate of the first filter output by a factor of five.

16. (Previously Presented) A decoder as in claim 6, wherein said fourth decimator reduces sampling rate of the intermediate signal by a factor of 20.

17. (Previously Presented) A decoder as in claim 1, wherein said phase angle estimation means operates at a frequency less than one tenth the predetermined frequency of the input signal.

18. (Currently Amended) A method for decoding an input signal using only digital circuitry, comprising:

receiving the input signal;

low pass filtering the input signal to provide a first output that contains a sum of left channel and right channel information;

multiplying a predetermined value by the input signal to generate an intermediate signal, the input signal having a pilot signal component that is also in the intermediate signal but reduced in frequency in the intermediate signal;

decimating the pilot signal component by a factor of substantially twenty to reduce a sampling rate of the pilot signal component to approximately twelve thousand samples per second;

estimating phase information of at least one component of the input signal using ~~only~~ a digital phase lock loop ~~circuitry~~ to provide first and second trigonometric functions using approximate phase of only the pilot signal component in the intermediate signal, the first and second trigonometric functions representing a phase angle needed to correct phase error associated with a second

output that contains a difference of left channel information and right channel information;

multiplying the first and second trigonometric functions with respective first and second outputs of quadrature mixers to form ~~a~~ the second output that contains a difference of left channel and right channel information; and

blending the first output and the second output to provide a left channel signal and a right channel signal by using dynamically and separately controlled low pass filters to first vary bandwidth of a first low pass filter processing the first output and subsequently vary bandwidth of a second low pass filter processing the second output to a different bandwidth depending upon received signal conditions.

19. (Previously Presented) A method as in claim 18, wherein the step of estimating phase information further comprises:

adding a predetermined phase correction to a phase value of the intermediate signal to produce a resultant phase value, wherein the predetermined phase correction is a function of a delay of a portion of the digital circuitry.

20. (Previously Presented) A method as in claim 18, wherein the step of estimating phase information further comprises:

multiplying a resultant phase value by a predetermined positive integer to produce a multiplied resultant phase value; and

providing the first and second trigonometric functions by determining first and second trigonometric values of the multiplied resultant phase value.

21. (Currently Amended) A method for decoding an input signal having a predetermined frequency and containing information on a left channel L and a right channel R, the method comprising:

low pass filtering the input signal to provide a first filter output;

decimating the first filter output to reduce a sampling frequency of the input signal;

providing an output signal that contains a sum of left channel information and right channel information;

multiplying a predetermined value by the input signal to generate an intermediate signal, wherein the input signal has a pilot signal component and wherein the pilot signal component in the intermediate signal is a lower frequency than the pilot signal component in the input signal;

low pass filtering the intermediate signal and providing the pilot signal component as an output;

decimating the pilot signal component by a predetermined decimation factor to reduce the sampling frequency to a rate no larger than substantially 12k samples per second;

determining with a digital phase lock loop an approximate phase of the pilot signal component of the input signal and generating at least one trigonometric function using the approximate phase of only the pilot signal component of the intermediate signal, the at least one trigonometric function representing a phase angle needed to correct phase error associated with an output signal that contains a difference of left channel information and right channel information;

shifting the input signal from the predetermined frequency to a lower frequency and forming a pair of quadrature signals;

low pass filtering each of the pair of quadrature signals;

decimating a first of the pair of quadrature signals to provide a first quadrature mixer output;

decimating a second of the pair of quadrature signals to provide a second quadrature mixer output;

generating a phase aligned output signal that contains a difference of the left channel information and the right channel information; and

generating a left channel signal and a right channel signal by dynamically and separately controlling filters to vary bandwidth thereof wherein bandwidth of a first low pass filter that filters the output signal that contains a sum of the left channel information and the right channel information is different from bandwidth of a second low pass filter that filters the output signal that contains a difference of the left channel information and the right channel information, the bandwidth control depending upon received signal conditions.

22. (Previously Presented) A method as in claim 21, wherein said low pass filtering each of the pair of quadrature signals is performed using at least one FIR filter.

23. (Previously Presented) A method as in claim 21, wherein at least a portion of said step of low pass filtering each of the pair of quadrature signals is performed in software.

24. (Original) A method as in claim 23, further comprising:

providing software modifiable filter coefficients.

25. (Currently Amended) A decoder, ~~having~~ for receiving an input signal with a predetermined frequency ~~and a first output signal~~, comprising:

a multiplier for multiplying a predetermined value and the input signal to generate an intermediate signal, wherein the input signal has a pilot signal component and wherein the pilot signal component in the intermediate signal is a lower frequency than the pilot signal component in the input signal;

a filter for receiving the intermediate signal and for providing the pilot signal component as an output;

decimating the pilot signal component by a decimation factor of substantially twenty and reducing a sampling rate of the pilot signal component to no greater than substantially twelve thousand samples per second;

~~phase estimation means~~ a phase lock loop for receiving the pilot signal component from the output of said filter, said phase ~~estimation means~~ lock loop determining an approximate phase of the pilot signal component of the input signal and generating at least one trigonometric function using the approximate phase of only the pilot signal component of the intermediate signal, the at least one trigonometric function representing a phase angle needed to correct phase error associated with an output signal that contains a difference of left channel information and right channel information;

quadrature mixer means coupled to the input signal for shifting the input signal from the predetermined frequency to a lower frequency by forming a pair of quadrature signals;

means for using the at least one trigonometric function and the pair of quadrature signals to generate ~~an~~ the output signal that contains a difference of the left channel information and the right channel information;

means for processing the input signal to provide ~~an~~ the output signal that contains a sum of the left channel information and the right channel information; and

means for using the output signal that contains a sum of left channel information and right channel information and using the output signal that contains a difference of left channel information and right channel information to generate a left channel signal and a right channel signal, the means comprising first and second dynamically and separately controlled low pass filters, the first low pass

filter processing the output signal that contains a sum of left channel information and right channel information and having its bandwidth varied after first varying bandwidth of the second low pass filter that processes the output signal containing a difference of left channel information and right channel information, an amount of bandwidth adjustment depending upon received signal conditions.